

WE CLAIM:

1. A method for real-time communication between a plurality of network subscribers in a communication system using Ethernet physics, comprising having a master unit and at least one slave unit communicate with one another by means of messages which are transmitted via the communication system; interchanging the messages cyclically with equidistant sampling times so that each slave unit is synchronized to the master unit by means of a common timebase; and using a timeslot access method as access control for transmission and reception communications between the network subscribers.

2. The method according to claim 1, further comprising synchronizing the slave units to the master unit so that each slave unit is clocked via a respective timer with a predetermined overall cycle time, and wherein the respective timer is set cyclically by the reception of a respective slave-specific synchronization information item which is determined by the master unit.

3. The method according to claim 2, wherein user data messages and specific synchronization messages which contain the respective synchronization information items are transmitted.

4. The method according to claim 2, wherein the synchronization information items are integrated in appropriately identified user data messages.

5. The method according to claim 2, wherein the timer in a slave unit automatically starts a new cycle once a predetermined overall cycle time has elapsed, even in the absence of synchronization information.

6. The method according to claims 2 and 5, wherein only the master unit has transmission authorization in the communication system for initialization and reports to each slave unit, and each slave unit has only response authorization, via an appropriate slave-specific message, wherein the overall cycle time has time slots in which the slave unit will receive messages from the master unit and timeslots in which the slave unit should send messages.

7. The method according to claim 6, wherein the slave unit is given a respective synchronization time in an initialization phase.

8. The method according to claim 2, wherein instantaneous values are stored in a slave unit at a common time.

9. The method according to claim 1, wherein with each message a slave unit sends a signal to the master unit, and the master unit stops that slave unit in a controlled manner in the absence of said signal.

10. The method according to claim 1, wherein monitoring information is provided in each message which is transmitted by the master unit to a slave unit, by

means of which security or safety functions which are provided in the slave unit can be activated directly via a second initiation channel.

11. The method according to claim 1, wherein the master unit sends a master life signal in each of its messages to each slave unit and, in the absence of this signal, each slave unit automatically reacts by stopping its own functions in a controlled manner.

12. The method in claim 1, wherein separate transmitting and receiving lines between two network subscribers are used simultaneously, so that all the slave units transmit only in the direction of the master unit and receive only messages from the direction of the master unit.

13. A method for real-time communication between network subscribers in a plurality of communication systems using Ethernet physics, wherein, within each communication system network subscriber communicates with one another in accordance with the method of claim 1, and further wherein a number of network subscribers have one circuit part in order to form network nodes, said circuit part being used for passing messages in the direction of another master unit or slave unit, and wherein communication between network subscribers via network nodes is also in accordance with the method of claim 1.

14. A communication system using Ethernet physics for carrying out real-time communication in accordance with the method of claim 1.

15. A hierarchical network having point-to-point connections, which are connected via network nodes, using Ethernet physics for carrying out real-time communication in accordance with the method of claim 1.

16. A distributed drive system having a hierarchical network according to claim 15, wherein a first communication system comprises a numerical movement controller as the master unit and at least one control unit as the slave unit, with each control unit being used as the master unit for a further communication system, which has at least one power section for driving a motor, and an associated transmission system (S1, S2) as slave units.